

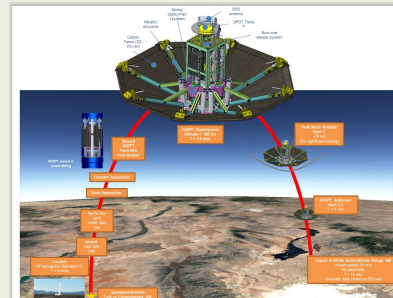


## Project Introduction

The ADEPT project is a new, advanced heatshield design to protect payloads and landers delivered to planetary bodies with atmospheres. ADEPT is a mechanically deployable heatshield, like an umbrella, that can open up at planet arrival to diameters 2-5 times greater than current rigid heatshields. This large size overcomes the current limitations of NASA's heatshields to enable delivery of 10s of metric tons to Mars' surface - essential for human exploration.

## Anticipated Benefits

ADEPT has been identified as a leading candidate for EDL architectures for Human Mars Exploration, ADEPT has potential as secondary payloads for Discovery and NF missions to Venus, Titan, and Mars. ADEPT is an enabling technology for delivery of 10s metric ton payloads to the surface of Mars NASA Unfunded: ADEPT has the potential with its low ballistic coefficient design to enable total global access to Mars surface not possible with current EDL technology. ADEPT has potential as secondary payloads for Discovery and NF missions to Venus, Titan, and Mars. ADEPT is an enabling technology for delivery of 10s metric ton payloads to the surface of Mars OGA: ADEPT team has had technical interchange meetings with other government agencies that are exploring the deployables for materials testing and sensors from LEO entry. Commercial: Strong potential for sample return from ISS and LEO with 'on demand' capability Nation: ADEPT supports missions to high priority destinations identified in recent decadal surveys. The stowable ADEPT can enable multiple entry vehicles packaged in the same volume as a rigid aeroshell



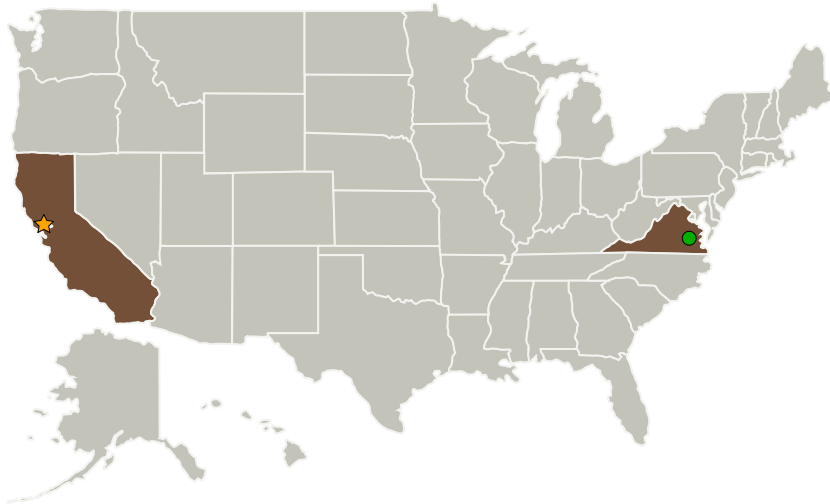
The Adaptable, Deployable, Entry and Placement Technology, ADEPT SR-1 project is developing a mechanically deployable low-ballistic coefficient aeroshell entry system to perform EDL functions for planetary missions.

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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Co-Funding Partners	Type	Location
Center Innovation Fund(CIF)	NASA Program	District of Columbia
Flight Opportunities(FO)	NASA Program	

Primary U.S. Work Locations	
California	Virginia

## Project Transitions



## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Ames Research Center (ARC)

### Responsible Program:

Game Changing Development

## Project Management

### Program Director:

Mary J Werkheiser

### Program Manager:

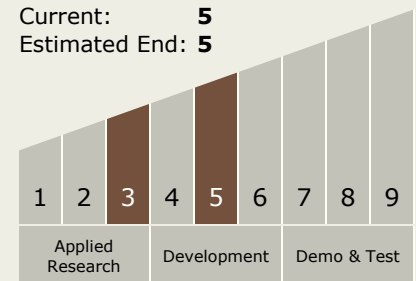
Gary F Meyering

### Principal Investigator:

Paul F Wercinski

## Technology Maturity (TRL)

Start: **3**  
Current: **5**  
Estimated End: **5**



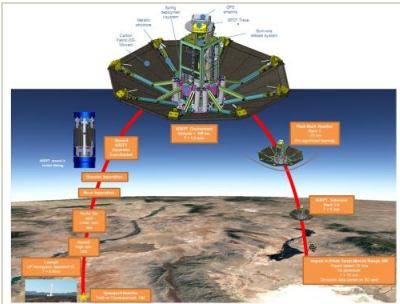


## ✓ March 2019: Closed out

**Closeout Summary:** The ADEPT Sounding Rocket One (SR-1) Project was initiated in October 2016 to advance technology readiness for a 1m diameter class D EV that could be applied to small satellite class payloads (<100kg). Early in the development phase, a Development Demonstrator was designed and tested to show how the proposed deployment mechanism would meet the design requirements and be compatible with launch environments. A series of drop tests were executed to characterize the impact load, evaluate various impact attenuators, and increase the reliability, robustness, and safety of the design. Other development activities included sub-sonic wind tunnel testing to understand pre-tension levels required to minimize fabric deflection under aerodynamic loading, subsonic free-flight testing used to inform a center of mass location requirements and aerodynamic database development. In September 2018, the ADEPT SR-1 DEV was launched on an UP Aerospace SpaceLoft Rocket from the Spaceport America Vertical Launch Area in New Mexico.

**Target Destinations**  
Mars, Others Inside the Solar System

## Images



### Adaptive Deployable Entry and Placement Technology (ADEPT) SR-1.jpg

The Adaptable, Deployable, Entry and Placement Technology, ADEPT SR-1 project is developing a mechanically deployable low-ballistic coefficient aeroshell entry system to perform EDL functions for planetary missions.  
(<https://techport.nasa.gov/image/143230>)

## Links

Adaptable Deployable Entry and Placement Technology (ADEPT)  
([https://www.youtube.com/watch?v=f\\_eWC7OZx2E](https://www.youtube.com/watch?v=f_eWC7OZx2E))



**Project Website:**

<https://www.nasa.gov/directorates/spacetech/home/index.html>